

**Environmental Assessment**

**for**

**The Sammy Hill Density Management Project  
OR 090-EA-99-15**

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**UNITED STATES DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
EUGENE DISTRICT**

**1792A  
Sammy Hill  
EA-99-15**

**ENVIRONMENTAL ASSESSMENT NO. OR090-99-15  
Sammy Hill Density Management Project**

**I. INTRODUCTION**

This Environmental Assessment (EA) will address a density management project in the Coast Range Resource Area of the Eugene District of the BLM. The proposed project area is located within the Lake Creek Watershed. in Section 1, Township 16 South, Range 8 West, Willamette Meridian, Lane County, Oregon, within the Late-Successional Reserve (LSR) and Riparian Reserve Land Use Allocations (see attached map of the proposed project area).

**A. CONFORMANCE**

The proposed action and alternatives are in conformance with the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl, April 1994 (ROD)* , and the *Eugene District Record of Decision and Resource Management Plan, June 1995 (Eugene District ROD/RMP)* to which this document is tiered. These EIS's are incorporated by reference.

Watershed analysis has been completed for the Lake Creek Watershed. The watershed analysis identified the need for silvicultural treatments within the Late-Successional Reserve and Riparian Reserves to accelerate the growth of trees for the attainment of the LSR objectives and the Aquatic Conservation Strategy (ACS) Objectives. This treatment is consistent with ACS Objectives (*ROD pages B-11 to B-13*).

A LSR assessment, *LSR Assessment for the Oregon Coast Province - Southern Portion (RO267, RO268)*, within which the project area lies, has been completed. The Regional Ecosystem Office has reviewed the LSR Assessment and found that it provides a sufficient framework and context for future projects and activities in the LSR. The proposed action and alternatives are consistent with the treatment criteria in the LSR Assessment.

On November 4, 1996, *Interim Guidance for Survey and Manage Component 2 Species: Red Tree Vole* was issued to implement component 2 of the Survey and Manage Standard and Guideline under the Northwest Forest Plan Record of Decision (*BLM Instruction Memorandum No. OR-97-009*). This memorandum contained both the management recommendations (interim guidance) and the survey protocol for the red tree vole. *Instruction Memorandum No. OR-98-105* extended the interim guidance through FY 99 or until

superseded by revised direction. The proposed action and alternatives are in conformance with this guidance.

Plan maintenance documentation postponing surveys for 32 Component 2 and Protection Buffer species was recently completed (*Plan Maintenance Documentation, USDI Bureau of Land Management, To Change the Implementation Schedule for Survey and Manage and Protection Buffer Species*, approved March 3, 1999). The proposed action and alternatives are in conformance with the direction provided in the Plan Maintenance Documentation. The implementation of the plan maintenance is provided for by BLM planning regulations (*43 CFR 1610.5-4*).

The effect of the plan maintenance action was analyzed in an environmental assessment, *To Change the Implementation Schedule for Survey and Manage and Protection Buffer Species*, issued October 7, 1998 (*Schedule Change EA*). The analysis contained in the Schedule Change EA is incorporated into this document by reference. Both the Schedule Change EA and the Plan Maintenance Documentation are available for viewing at the Eugene BLM District Office or on the internet at <http://www.or.blm.gov/nwfp.htm>.

Additional site-specific information is available in the Sammy Hill Density Management analysis file. This file and the above referenced documents are available for review at the Eugene District Office.

## **B. MANAGEMENT OBJECTIVES FOR LAND WITHIN THE LATE-SUCCESSIONAL RESERVE**

"Silvicultural systems proposed for Late-Successional Reserves have two principal objectives: (1) development of old-growth forest characteristics including snags, logs on the forest floor, large trees, and canopy gaps that enable establishment of multiple tree layers and diverse species composition; and (2) prevention of large-scale disturbances by fire, wind, insects, and diseases that would destroy or limit the ability of the reserves to sustain viable forest species populations." (*ROD B-5*)

## **C. MANAGEMENT OBJECTIVES AND GOALS FOR THE RIPARIAN RESERVE**

"Under the Aquatic Conservation Strategy, Riparian Reserves are used to maintain and restore riparian structures and functions of streams, confer benefits to riparian-dependent and associated species other than fish, enhance habitat conservation for organisms that are dependent on the transition zone between upslope and riparian areas, improve travel and dispersal corridors for many terrestrial animals and plants, and provide for greater connectivity of the watershed." (*ROD B-13*)

## **D. PURPOSE AND NEED FOR ACTION**

The purpose of the action within the LSR and Riparian Reserves is to hasten the development of late-successional forest structural characteristics. This would require density management (thinning) and creation of ¼ acre and ½ acre patch-cuts to open up the existing overstory canopy to allow sufficient light for the growth and development of trees and vegetation in the understory. This action would encourage the development of multiple tree layers and diverse species. The need for the action in the LSR is established in the "*Eugene District Record of Decision and Resource Management Plan*," June 1995 (*Eugene District ROD/RMP page 30*), which directs that thinning be conducted in the LSR if needed to create late-successional forest conditions. This need is further detailed in the *LSR Assessment for the Oregon Coast Province - Southern Portion (RO267, RO268)*, which determined that thinning of uniform, dense stands would accelerate attainment of some late-successional forest characteristics (*LSR Assessment, pp. 35-37*).

The need for the action in the Riparian Reserves is established in the *Eugene District ROD/RMP*, which directs that silvicultural practices be applied in Riparian Reserves to develop desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives.

Specific objectives of this action in the LSR and Riparian Reserves are to provide for long-term increased individual tree growth rates to develop large overstory trees; enhanced tree species diversity; increased structural and spatial diversity; development of canopy layering and patchiness; and to encourage the development of large coarse woody debris and snags.

## **II. ALTERNATIVES INCLUDING THE PROPOSED ACTION**

This section describes the proposed action and alternatives developed through the interdisciplinary team (ID Team) review process.

### **A. ALTERNATIVE 1 (PROPOSED ACTION)**

The proposed action, the Sammy Hill Density Management Project, is designed to accelerate the development of late-successional forest structural characteristics as stated in the LSR and Riparian Reserve (ACS) objectives and goals above. The proposed action would include thinning of trees in the overstory ; the creation of ¼ acre and ½ acre patch-cuts or gaps within the forest stands; tree planting; and felling of trees for additional down wood. The proposed thinning would promote individual tree growth, the development of large crowns, and would open up the existing overstory canopy to allow sufficient light for the growth and development of seedlings, trees, and vegetation in the understory. The proposed patch-cuts with planting would encourage the development of multiple tree layers and diverse species within the project area.

The project area for the proposed density management treatment is predominantly Douglas-fir with a minor component of western hemlock, western redcedar, and hardwoods. The project area (approximately 206 acres) contains stands with an approximate birth date between 1934-1939 (60-65 years old). The project area has been divided into 3 areas or “strata” for treatment purposes. The treatments by strata are described later in the assessment. The proposed action would remove approximately 3.5 million board feet (MMBF) of timber volume from approximately 148 treated acres within the project area. Approximately 58 acres (28 percent) of the total project area would be left untreated.

### **RESERVES**

#### Riparian Reserve

The height of one site-potential tree in the Lake Creek Watershed has been determined to be approximately 210 feet slope distance. Riparian Reserves (widths of 210 feet on either side of non-fish bearing streams, and 420 feet on either side of fish bearing streams) would be managed in accordance with the standards and guidelines in the *ROD (Standards and Guidelines C, pp. 31-38)* and the *Eugene District ROD/RMP*. Density management would occur within a portion of the Riparian Reserve with the proposed action.

The Riparian Reserve treatment would promote development of large conifers, recruitment of large woody debris, and improve diversity of species composition and stand density for the attainment of Aquatic Conservation Strategy Objectives (ACS objectives). The total Riparian Reserve within the project area is

approximately 86 acres. Approximately 28 acres (33 percent ) of the Riparian Reserve within the total project area would be treated. Treatments would include ¼ acre and ½ acre patch-cuts, thinning, and down wood creation. See design features 4 through 7 for a description of no-treatment buffers and project requirements within the Riparian Reserve to protect stream channels and fisheries resources.

#### Survey and Manage Mollusk Buffers

No Survey and Manage Mollusk sites were located within the treatment area of the proposed action or alternatives. One mollusk species, *Megomphix hemphilli*, (a land snail) was found at one site within the survey area (234 acres) for all alternatives, however this known location is within a no treatment area within the Riparian Reserves and would not require any additional buffer with the implementation of all alternatives.

#### Botanical Buffers - Survey and Manage and Protection Buffer Species

Survey and Manage Botanical sites would receive buffers to reduce edge effects and disturbance to these species. No disturbance would occur within the sites buffered. All tree felling would occur directionally away from these buffer areas and no yarding would occur through these buffered areas. Prescribed burning, site preparation, tree planting, or salvage logging would not occur in these buffered areas. These buffers are described in greater detail by species under botanical resources within the *Affected Environment* section of the EA (also see design features 2 and 3)

### **TREATMENT CRITERIA**

#### Tree Selection (Cut Trees)

Trees selected for removal would be from all diameter classes less than 28" DBH and greater than 6 inches in diameter at breast height (DBH).

#### Retention Trees and Leave Tree Areas

Larger trees and trees with desirable characteristics for habitat (large crowns or trees with physical imperfection such as cavities, broken tops and large deformed limbs) would be the preferred leave trees. Larger trees would be favored as retention trees since the objective is to create large conifer canopies, however to maintain and promote species and structural diversity within the LSR and Riparian Reserve, some small diameter trees and trees of minor species (western redcedar, Pacific yew, and hardwoods) would be retained.

Retention trees and leave tree areas would be used where feasible to provide protection for existing down wood debris, snags, rock outcrops, and to benefit resource and habitat features and streams. An additional leave tree area would be placed in the upland to provide resource protection for *Ulota megalospora*, a Protection Buffer moss species found within the project area. (See design features 3, 10, and 11 for additional guidelines on leave trees and leave tree areas.)

#### Thinning Pattern

Thinning would promote individual tree growth, the development of large crowns, and would open the existing overstory for understory development. Thinning would be done in such a manner to provide irregular spacing. Leave tree densities would range from 40-110 trees per acre across the treatment area. (See strata guidelines below for variations in thinning densities by strata.) (Leave tree densities would be higher in untreated leave patches.)

### Gaps or Openings (Patch-Cuts)

Gaps or openings would be created by either managing or enlarging existing openings or by creating approximately ¼ acre and ½ acre patch-cuts on approximately 9% (approximately 14 acres ) of the total project area to increase stand diversity and understory development in these areas. (See design feature 16.)

### Planting

The ¼ acre and ½ acre openings created by treatment would release (maintain) the current conifer understory and would be planted with a variety of species to accelerate the development of multiple tree canopy layers and diverse species composition. Some underplanting would also occur in the understory, dependent upon the size of the canopy openings and the availability of light in the understory for the newly planted seedlings. Seedlings planted would be primarily Douglas-fir, western redcedar and western hemlock depending on seedling availability. (See design features 17, 19, and 20 for additional guidelines on planting and site prep in support of planting.)

### Down Wood Treatment

For the purpose of long term productivity and maintenance of biological diversity, all existing down wood would be retained both in the upland and Riparian Reserve. In addition to retaining all existing down wood in the upland and riparian, approximately 3 trees per acre 20" D.B.H. or greater would be cut and left for down woody debris from 50 to 200 feet from the stream channel within the Riparian Reserve. The distribution of this down wood and the need for additional down woody debris would be further evaluated upon completion of thinning and would be provided by cutting and leaving additional green trees on the ground (cut-leave) as appropriate. (See design feature 9.)

### Snags

Approximately 50 snags have been created within the project area with a recent snag creation project. Design feature 8 provides for the protection of existing snags and future snag recruitment needs as determined by a wildlife biologist.

## **LEAVE TREE DENSITY GUIDELINES BY STRATA WITHIN PROJECT AREA**

The project area has been divided into 3 areas or "strata" based on existing stand conditions. A minimum canopy closure of approximately 40% would be retained overall within the project area.

### Sammy Hill Strata No. 1

The current stand density of Strata No. 1 is approximately 240 trees per acre and the current basal area is approximately 290 sq. ft per acre. This strata would be thinned to varying tree densities ranging from 40 - 70 leave trees per acre with the majority of the thinning in the 60 - 70 leave tree per acre range.

### Sammy Hill Strata No. 2

Current stocking of Strata No. 2 is approximately 320 trees per acre and the current basal area is approximately 280 sq. ft. per acre. This strata would be thinned to varying tree densities ranging from 60 - 110 leave trees per acre with the majority of the thinning in the 90 - 110 leave tree per acre range.

### Sammy Hill Strata No. 3

Current stocking of Strata No. 3 is approximately 115 trees per acre and the current basal area is approximately 200 sq. ft per acre. This strata was commercially thinned approximately 16 years ago. This strata would be thinned to varying tree densities ranging from 40 - 70 leave trees per acre with the majority of the thinning in the 40 - 50 leave tree per acre range.

## **ROAD ACCESS**

All roads within the sections would be evaluated at a later date within the context of a district wide transportation management plan to meet resource needs. See project design feature 21 and 22 for required road and spur construction and decommissioning requirements.

## **PROJECT DESIGN FEATURES OF THE PROPOSED ACTION**

The following project design features would be implemented in conjunction with the proposed action. Project design features are operating procedures normally used to avoid or reduce environmental impacts as developed by the interdisciplinary team.

## **DESIGN FEATURES**

### Noxious Weeds and Non-natives

1. In order to slow the spread of noxious weeds, all yarding and road construction equipment would be cleaned prior to its arrival on Bureau of Land Management land. In the unlikely event roadside seeding does occur, annual and perennial rye mixtures with strict guidelines on seed purity (no crop or noxious weed content) would be used.

### Botanical Buffers - Survey and Manage and Protection Buffer Species

2. *Loxosporopsis corallifera*, a S&M Component 1 and 3 species found incidental to other surveys, was present over much of the unit with a large concentration in the locale of Strata No. 3 which was previously commercially thinned. Patch-cuts would not be placed within this high concentration area of *Loxosporopsis corallifera*, however this area would be thinned.

3. *Ulota meglospora*, a Protection Buffer moss was found at one site (Site D) within the Alternative 1, Proposed Action treatment area and at two additional sites within the survey area. Site D is located within the high concentration area of *Loxosporopsis corallifera* and would receive approximately a 0.25 acre (approx. 60 ft. radius) no-treatment buffer to reduce disturbance and edge effects.

### Riparian Reserves

4. Thinning within the Riparian Reserve was prescribed to develop a diverse large conifer canopy within the reserve to meet the long term objectives of the Aquatic Conservation Strategy. Approximately 28 acres (33 percent ) of the Riparian Reserve within the total project area would be treated. Cable yarding with one end suspension would be required when yarding within Riparian Reserve. Direction felling and yarding away from streams would be required to provide for streambank stability and water quality.

5. Streams numbered 9, 10, and 11 on the EA project map may require yarding across the stream channel. Full suspension of logs would be required when yarding across these stream channels and adjacent banks. Yarding corridors would not exceed 12 feet in width. All corridor trees within the non- treated Riparian Reserve buffers would be cut and left to contribute to down wood. (Any yarding corridors across these streams would be within 45 degrees of perpendicular to the stream channel.)

6. Variable width no-treatment stream buffers ( minimum of 50 feet each side of the stream) would be provided to maintain existing water quality and bank stability to meet ACS objectives. Some yarding corridors would be needed through these stream buffers on streams numbered 9, 10 and 11 on the project EA map (See design feature 5 above).

7. No-treatment areas would be placed in areas where the slope percent adjacent to the stream is greater than 80%. The fish bearing (cutthroat trout) reach of the main east tributary of Greenleaf Creek within the project area (below the junction of stream numbers 1 and 14 on the project EA map) and the adjacent over-steepened riparian sideslopes would be excluded (reserved) from the treatment area due to potential slope instability in this area. A no-treat buffer (two site-tree or approx. 420 ft) , would be maintained each side of the stream in this area.

#### Green Tree Retention, Snags, and Coarse Woody Debris

8. To provide habitat for cavity dependent wildlife and to protect the future source of down logs, snags not posing a safety hazard would be reserved. Directional felling and yarding would be utilized to protect residual green trees and snags consistent with State safety practices. Snags felled as danger trees would be retained as CWD. Additional green trees would be reserved for future snag recruitment needs as determined by a wildlife biologist.

9. For the purpose of long term productivity and maintenance of biological diversity, retain all existing down wood. An average of approximately 3 trees per acre 20" DBH or greater would be cut and left for down woody debris from 50 to 200 feet from the stream channel within the Riparian Reserve. The distribution for this down wood and the need for additional down woody debris would be further evaluated upon completion of thinning and would be provided by "cut-leave" of additional trees as appropriate.

10. Residual overstory conifers and hardwoods 28" and larger would be reserved. This would include all legacy trees with old growth characteristics and large residual wolf trees (green, open-grown, limby trees). If live conifers and hardwoods greater than 28" D.B.H. are cut in yarding corridors they would be left on-site to contribute to down CWD. Snags and legacy trees within the stands would be retained even if within created patch-cuts.

11. The minor species Pacific yew, western redcedar, and hardwoods would be retained to provide for species diversity. Conifers 6 inches dbh and smaller would be retained.

#### Yarding

12. Harvest activities would not occur during sap flow season (April 15- June 15) to limit bark / cambium damage to reserve trees. During yarding, log lengths would be limited to a maximum of 40 feet in the thinning areas to protect residual trees during yarding.

13. Cable Yarding - A cable system capable of lateral yarding 75 feet would be used. Yarding corridors would not exceed 12 feet in width. A minimum of one-end suspension would be required when cable yarding both in the upland and Riparian Reserve. Intermediate supports would be used when necessary to achieve the required suspension. All yarding would be to designated landings.

14. Unmerchantable tree tops and limbs would not be yarded to the landing and should be left on site to contribute to soil productivity.

15. Yarding would be done from a newly constructed temporary spur and road, existing road grades, and renovated existing road grades with cable yarding equipment. All yarding would be to designated or approved landings. No equipment would be allowed off roads during wet weather or high soil moisture conditions. A portion of the yarding would be done through private lands to existing Road Number 16-8-2.

#### Patch-cuts

16. The riparian reserve and upland thinning treatment would include creating gaps or openings of  $\frac{1}{4}$  and  $\frac{1}{2}$  acres. These patch cuts would be located away from headwall areas to maintain amphibian habitat and approximately 100-150 feet from roads to mitigate any fuel and noxious weed concerns.

#### Site Preparation and Fire Hazard Reduction

17. Site prep in support of tree planting would occur only if determined necessary for seedling survival and establishment to meet wildlife objectives. The need for site prep for tree planting purposes within the patch-cuts, natural openings and understory would be evaluated after harvest and treated as needed using hand piling or swamper burning. Site preparation methods would be done in a manner that would minimize soil disturbance and minimize coarse woody debris consumption.

18. Debris piles created along roads with unlimited access would be covered and then burned after fall rains have begun. Piles along gated, blocked or subsoiled roads would be left unburned for wildlife habitat.

#### Planting

19. Patch-cuts would be planted with a variety of tree species. The areas to be planted would be evaluated after harvest. Seedlings planted would be primarily Douglas-fir, western redcedar and western hemlock depending on seedling availability. Trees would be planted at densities ranging from approximately 200-400 trees per acre dependent on plantability.

20. Additional planting would occur in the thinned understory. The distribution and need for additional planting in the understory and natural openings to provide structural and species diversity and wildlife cover, would be further evaluated by a wildlife biologist, botanist, and silviculturist upon completion of thinning. The locations and amount of underplanting within the stands would be influenced by the availability of light in the understory for the newly planted seedlings and distribution of woody debris on the forest floor.

#### Road Access

21. There would be approximately 670 feet of renovation to the existing 16-8-2.2 road on private lands. The existing 16-8-2.2 road would be temporarily extended with approximately 2,030 feet of new construction and Spur A would also be constructed. Spur A would be approximately 255 feet in length. The total length of new road and spur construction would be approximately 2,285 feet.

22. All roads would be built to SN-14 width standards and would be a natural surface (dirt). The newly constructed 16-8-2.2 road extension and Spur A would be decommissioned by subsoiling, waterbarring, and blocking upon completion of the logging to reduce disturbance to wildlife and reduce the movement of

noxious weeds by vehicle traffic. Limbs and organic debris would be scattered over these roads after subsoiling.

#### **B. ALTERNATIVE 2**

This alternative would be similar to Alternative 1 except the Riparian Reserve would not be thinned to promote development of large trees and late-successional habitat.

#### **C. ALTERNATIVE 3**

This alternative would be similar to Alternative 1 except Strata No. 3, approximately 24 acres on the southeast side of the project area that was commercial thinned in 1983 would not be thinned again. Strata No. 3 is also the location of a large concentration of *Loxosporopsis corallifera* a Survey and Manage (S&M) Component 1 and 3 lichen species, and the location of Site D of *Ulota megalospora*, a Protection Buffer moss.

#### **D. ALTERNATIVE 4 (NO ACTION)**

All timber harvest activities would be deferred, and no management activities described under Alternatives 1-3 would occur at this time.

### **III. ISSUES NOT ANALYZED**

No site specific surveys were completed for any of the 32 Component 2 or Protection Buffer species listed in the Schedule Change EA. None of these species were found, incidental to other surveys. However, it is possible that individuals may reside in the project area. The issue of how the Proposed action and alternatives would impact potential locations of these Protection Buffer species was not analyzed because impacts are not expected to exceed those described in the Schedule Change EA.

### **IV. AFFECTED ENVIRONMENT**

This section will describe key components of the existing environment. The plants and animals in the project area do not differ significantly from those discussed in the *Eugene District Proposed Resource Management Plan/Environmental Impact Statement (RMP EIS, 1994) (Chapter 3)*.

The Lake Creek Watershed lies at the northeastern headwaters of the Siuslaw River Basin. The Lake Creek watershed contains approximately 68,771 acres. The pattern of the current landscape in the Lake Creek Watershed is largely influenced by the checkerboard ownership pattern. BLM administers 31,950 acres or approximately 46 per cent of the watershed. Approximately 19,159 acres of the Lake Creek Watershed are designated as Late-Successional Reserve (LSR). This is approximately one third (27.8%) of the total watershed area and approximately 60 percent of the BLM ownership in the watershed. Approximately 16,078 acres (50 percent) of the BLM managed lands within the watershed is designated as Riparian Reserve. (*Lake Creek Watershed Analysis, 1995*)

#### **VEGETATION**

BLM administered lands within the watershed are comprised of the following approximate forested acres and percentages by vegetation class (*Based on Forest Operations Inventory (FOI) stand data 1998*):

◀ 0 year age class	93 acres	0.3%
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◀ 10 year age class	2,169 acres	7.1%
◀ 20 year age class	2,851 acres	9.3%
◀ 30 year age class	3,841 acres	12.5%
◀ 40 year age class	4,025 acres	13.1%
◀ 50 year age class	3,869 acres	12.6%
◀ 60 year age class	6,995 acres	22.8%
◀ 70 year age class	1,107 acres	3.6%
◀ 80 year age class	870 acres	2.8%
◀ 90 year age class	294 acres	1.0%
◀ 100 year age class	12 acres	0.0%
◀ 110 year age class	492 acres	1.6%
◀ 150 year age class	21 acres	0.1%
◀ 160 year age class	118 acres	0.4%
◀ 170 year age class	62 acres	0.2%
◀ 180 year age class	1,055 acres	3.4%
◀ 190 year age class	62 acres	0.2%
◀ 200 year age class	2,776 acres	9.0%

Approximately 19 percent of the Federal (BLM) forested acres within the watershed are currently in a late-successional ( $\geq 80$  years of age) condition of which most are in reserves. (Based on Forest Operations Inventory (FOI) stand data 1998)

#### Stand Description

The stand within the proposed project area (approximately 206 acres) is a second growth, mixed Douglas-fir/western hemlock stand approximately 60-65 years old with a western redcedar component. Hardwoods present include bigleaf maple, red alder, and golden chinquapin. The southeast portion of the stand (Strata No. 3 on the EA map) was commercially thinned approximately 16 years ago. The current stand density in this area is approximately 115 trees per acre. The current overstory stand density of the remainder of the project area, Strata No. 1 and No. 2, ranges from 240- 320 trees per acre (TPA). The current stand is dense relative to the desired late-successional objectives identified for the stand.

The brush layer is dominated primarily by vine maple, Pacific rhododendron, and evergreen huckleberry in light to moderate amounts. Ground cover varies from minimum to dense and consists predominantly of sword fern, salal, bracken fern, and Cascade Oregon grape. Other common brush species include salmonberry and thimbleberry in the riparian areas. Plant associations include Douglas-fir/swordfern, Douglas-fir/ocean-spray/salal-Cascade Oregon grape, and some drier Pacific rhododendron/beargrass with golden chinquapin. Overall, the project area does not have much plant diversity on a broad scale. Most variety was found in riparian areas.

### **BOTANICAL RESOURCES**

#### Special Status and Survey and Manage Plant Species

No federally listed Threatened, Endangered, or Sensitive vascular plant species were located during botanical surveys.

Surveys for *Ulota megalospora*, a Protection Buffer moss species, were conducted during the same time frame as the above surveys according to survey protocols established by the Eugene District Botany Work Group. Protocols were developed using information from *Appendix J2 of the Final Supplemental Environmental Impact Statement on Management of Habitat for Late- Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl ( Appendix J2 of the FSEIS)* and local expertise. Three sites of *Ulota megalospora* were located in the survey area; including one site (A) located within the protected, no-treatment area of the Riparian Reserve; one site (B) located on a windthrown tree leaning over from private lands onto BLM land along the western property line; and one red alder cluster location (Site D) near the main road within a high concentration area of *Loxosporopsis corallifera* described below. Site D would receive approximately a 0.25 acre (approx. 60 ft. radius) no-treat buffer.

*Loxosporopsis corallifera*, a Survey and Manage (S&M) Component 1 and 3 species found incidental to other surveys, is present over much of the survey area with a large concentration in the locale of Strata No. 3 which was previously commercially thinned. Northwest Forest Plan Standards and Guidelines for Protection Buffer species require surveys prior to ground-disturbing activities. However, consistent with the Plan Maintenance Documentation referenced earlier, site specific surveys for *Loxosporopsis corallifera* were not conducted in the proposed project area. Thinning would occur through the *Loxosporopsis corallifera* area with this alternative. No patch-cuts would occur in this area of large concentration of this species.

#### Noxious Weeds and Non-native Plant Species

Spots of individual Scot's broom (*Cytisus scoparius*) plants were found along the main roadside. These were pulled during the summer of 1998.

#### **SOILS**

The project area has soils classified as the Peacher, Blachly, and Cumley. The Preacher series consists of moderately deep, well drained, brown loam soils. The Preacher soils are members of the fine-loamy, mixed, mesic family of *Typic Haplumbrepts*. They can occur on gently sloping to steep slopes. The Preacher series is found on the majority of the project area. The Blachly series consists of deep, red, clayey soils. They occur on gently sloping ridgetops and stable sideslopes. The Blachly clay loam soils are members of the fine, mixed, mesic family of Umbric Dystrochrepts. The Blachly series is found in the northern part of the project area (the headwater areas of the east tributary of Greenleaf Creek). The Cumley series consists of deep, moderately well drained, clayey soils. The Cumley soils are members of the clayey, mixed, mesic family of *Typic Haplohumults*. These soils are predominantly found on gently to moderately sloping mountain footslopes. The Cumley soils are found as a narrow band on the sideslopes adjacent to the east tributary of Greenleaf Creek where it flows through the central part of the project area.

The adjacent oversteepened riparian sideslopes of the east tributary of Greenleaf Creek at the south end of the project area would be excluded (reserved) from the treatment area due to potential slope instability in this area (see project EA map and design feature 7).

#### **AQUATICS AND RIPARIAN RESOURCES / FISHERIES**

There are currently no proposed or listed fish species in the project area. The Coastal Ecological Significant Unit (ESU) of coho salmon listed as a threatened species is found in Greenleaf Creek approximately four miles downstream from the project. Suitable habitat for coho, salmon, chinook salmon, and steelhead is located approximately two miles downstream from the project area tributaries in Greenleaf Creek. As a

result of two natural barriers, coho, chinook, and steelhead, all present in lower Greenleaf Creek, are unable to pass into upper Greenleaf Creek. Habitat types include riffles, rapids, pools, and cascades. Substrates include gravel, rubble, sand, silt, and cobble. Boulders and high amounts of logs and wood debris are available for structure and cover.

Cutthroat trout were located in the main east tributary of Greenleaf Creek within the proposed project area below a bedrock slide falls. No fish were located above the bedrock slide falls of this tributary. Fish access into the tributary at the southwest corner of the project area is stopped by a very high, long falls area with rock slides and steps located downstream from the project near the confluence with the main east tributary. Steep sideslopes adjacent to the fish bearing (cutthroat trout) reaches within the project area would be excluded (reserved) from the treatment area due to potential slope instability in these areas. Riparian vegetation includes second growth conifers, hardwoods, and brush.

The transient Rain - On - Snow (ROS) zone in western Oregon is considered to be formed approximately 1150 feet to 3500 feet. The maximum elevation of the proposed project area is approximately 1900 feet.

## **WILDLIFE**

### Threatened and Endangered Species

There are no activity centers for any terrestrial species listed or proposed under the Endangered Species Act within the project area. There is one northern spotted owl activity center within 1.5 miles of the treatment area. The Druggs Creek (*MSNO#2543*) spotted owl core area is located to the southeast of the unit within 0.2 mile. It has been occupied by barred owls since 1996. A ridge separates this owl core area from the treatment area. The treatment area does not contain suitable habitat for these species, but is comprised of dispersal habitat for the northern spotted owl. The project area lies within a Critical Habitat Unit (*CHU OR - 48*) for the northern spotted owl.

No habitat for the marbled murrelet exists within the harvest unit, but some residual habitat does exist within 0.25 mile of the proposed action. The final year of a two year murrelet survey as defined by the Pacific Seabird Group protocol will be completed in August, 1999. No detections were recorded during the first year of surveys in 1998. If murrelets are detected during the second year, this action would be modified (either through buffers, reinitiation of consultation, or seasonal restrictions), eliminating disturbance to these birds if they were to occur in the above mentioned stands. The project area lies within a Critical Habitat Unit (*CHU OR-04-J*) for the marbled murrelet.

A bald eagle habitat area (BEHA) is located approximately 1/4 mile to the northeast of the treatment area. This is part of a series of BEHAs meant to provide present and future habitat for bald eagles as their population increases. No eagles have been documented here in spite of annual spotted owl surveys, goshawk surveys, and the murrelet survey in 1998.

The above information is based on current knowledge of these species within the vicinity of the action area. If any new information regarding these or other protected animals arises, this action would be subject to mitigation measures intended to safeguard the species.

### Special Status Species

In 1995, a northern goshawk nest with two chicks was discovered approximately one mile east of the proposed harvest unit. Subsequent annual surveys have not resulted in further detections of this species in or near the area. If these birds are determined to be nesting, within or near the proposed unit during future surveys, appropriate mitigation measures would be pursued.

No sensitive amphibians were located during general wildlife surveys. No surveys specifically targeted for bats were conducted, however within the project area there were few large snags that could provide refugia for bat species.

#### Survey-and-Manage Species

The Lake Creek Watershed met the minimum red tree vole threshold habitat interim guidance requirements (potential habitat sufficient for dispersal), therefore no site specific surveys are required. (*BLM-Instruction Memorandum No. OR-97-009*) *Instruction Memorandum No. OR-98-105* extended the interim guidance through FY99 or until superseded by revised direction.

Some Survey and Manage and Protection Buffer species have not had survey protocol or management recommendations completed. District Working Groups (wildlife specialists) have developed interim management guidelines utilizing *Appendix J2 of the FSEIS* and local expertise where needed to implement the survey and manage standard and guidelines.

Protocol surveys were conducted and completed for Strategy-2-Mollusk Species during the fall of 1997 and the spring of 1998. One mollusk species, *Megomphix hemphilli*, (a land snail) was found at one site within the survey area (234 acres) for all alternatives. This known location is within a no-treatment area with all alternatives.

#### Big game

Black-tailed deer and elk occur in the project area. The proposed project area presently serves as hiding cover and to a minor extent thermal cover for deer and elk. Nearby clear-cuts on private lands would be used for foraging by both deer and elk.

Within the unit there are some scattered large standing and down trees that could provide denning sites for black bears. Additionally, neighboring older stands would provide this material. Black bears are known to exist within the area although no signs of this animal were detected during field visits.

#### Neotropical migrants

Species preferring early to mid-successional coniferous forests and edge habitat such as the dark-eyed junco, winter wren, and corvids, would be expected to occur within the project area.

#### Other Wildlife

Besides the previously mentioned owl and goshawk nests, there are no known raptor nests in the project area or in the close vicinity. There are also no known heron rookeries in the project area or in the close vicinity.

### **SNAGS / DOWN WOODY DEBRIS / FUELS**

There is a moderate amount of large down woody debris present. Smaller diameter, pole sized down wood (5-10 inches) is abundant, occurring in patches and scattered within the project area. Some scattered large snags and short snags occur within the project area. Approximately 50 snags have been created within the project area with a recent snag creation project. The pre-harvest fuel bed is variable throughout with an average of approximately 18 tons per acre.

### **CULTURAL RESOURCES**

A cultural resource inventory of the proposed area has not been completed. Past pre-project inventories in the lands administered by the Bureau of Land Management within the Coast Range Physiographic Province have not resulted in the discovery of historic properties, therefore no cultural resources are expected to be affected. The guidelines of the protocol agreement (Protocol Appendix D) between the Bureau of Land Management and the Oregon State Historic Preservation Officer (1998) makes the conclusion "that the chances of finding important historic properties in the area are so minimal such that further cultural resource survey prior to project implementation does not justify the continued expenditure of federal funds in the effort". The protocol agreement does set forth procedures covering post-project cultural resource surveys which would be implemented.

### **VISUAL RESOURCES**

The project area is classified as Visual Resource Management Class IV, which allows for moderate levels of change to the characteristic landscape. Management activities may dominate the view and be the major focus of viewer attention. A density management project (variable spaced thinning with ¼ acre and ½ acre patch cuts) in this area would not exceed this level of change (*Eugene District ROD/RMP, June 1995; pages 75-78*)

### **RECREATION RESOURCES**

The proposed project area is not within a Special Recreation Management Area (SRMA) and has no Rural Interface issues or Wild and Scenic River (WSR) issues.

## **V. DIRECT AND INDIRECT EFFECTS**

### **A. UNAFFECTED RESOURCES**

The following resources are either not present or would not be affected by the proposed action or any of the alternatives: Areas of Critical Environmental Concern, prime or unique farm lands, floodplains, Native American religious concerns, solid or hazardous wastes, Wild and Scenic Rivers, Wilderness, and low income or minority populations.

**CULTURAL RESOURCES** - are not expected to be affected by the proposed action or any of the alternatives

**RECREATION AND VISUAL RESOURCES** - would not be affected by the proposed action or any of the alternatives. These resources will not be addressed further in the analysis.

**AIR QUALITY** - Burning activities, if required for site preparation and for roadside fire hazard reduction (design features 17 and 18), would be consistent with Oregon Smoke Management Regulations. The proposed burning would be of very short duration and would have no local short or long-term impacts on air quality. All burning would meet the State Implementation Plan for smoke management and the National Ambient Air Quality Standards set forth in the Clean Air Act. This resource will not be addressed further in the analysis. The proposed project area is approximately 13 miles west of the Willamette Designated Area (DA).

## **B. DIRECT AND INDIRECT EFFECTS OF ALTERNATIVE 1 - THE PROPOSED ACTION**

### **VEGETATION**

Upland Vegetation- The proposed density management treatment would create structural and spatial diversity with a variety of tree densities within the upland LSR. Sustained individual tree growth would vary throughout the treatment area with differences in retained tree densities. Individual trees within the lower retained density areas would show greater increased and sustained growth, primarily in diameter and crown development due to the increased growing space provided. This would accelerate the development of large trees and late-successional stand characteristics and would provide a source of large snags and coarse woody debris in these areas of the stand.

A variation of understory vegetation response of herbs and shrubs combined with multi-layered canopy development is expected with varying light conditions in the understory due to differences in retained overstory tree densities and canopy closure in the upland. Understory vegetation response and multi-layered canopy development would be greater in the areas of the stand where lower retained overstory tree densities occur due to the increased light to the forest floor.

Current vegetative and structural diversity would be maintained by reserving legacy trees and minor species. Herbaceous, fungal, and bryophyte diversity would be maintained by retention of snags and existing down logs both within blowdown patches and throughout the treatment area.

Canopy gaps and the proposed ¼ acre and ½ acre upland patch-cuts would facilitate the development of multi-layered and patchy stand characteristics. The micro-habitats and climates associated with gaps would favor the initiation of an understory and the development of structural and habitat characteristics associated with mature forests. Planting of these areas and portions of the understory would speed the development of multi-layered canopies and would contribute to species and structural diversity.

### Riparian Vegetation

Approximately 28 acres (one-third) of the Riparian Reserve would be treated to promote tree growth and large crown development. Vegetation effects for those acres treated within the Riparian Reserve would be similar to those described above for the upland. The remainder of the Riparian Reserve would remain untreated to protect riparian aquatic, and fisheries associated resources described in the existing conditions. The effects to vegetation and the forest stand in the no-treatment areas of the Riparian Reserve would be similar to those effects described within the riparian vegetation effects under the No Action Alternative 4.

### **BOTANICAL RESOURCES**

No Threatened, Endangered or Special Status plant species would be affected by the proposed action. Survey and Manage Component 1 and 3, and Protection Buffer species are known to occur within the survey area as described in *Section IV, Affected Environment* of the EA.

Thinning and removal (patch cuts) of the overstory canopy would result in changes in microclimate for plants and fungi; increasing light and wind intensities; and decreasing soil moisture and relative humidities. The diversity and cover of shrub and herbaceous species would be expected to increase in the first few years following thinning although this effect would be expected to also dissipate as tree canopies expand in the overstory. In the patch cuts, plant communities would be expected to shift toward an early seral condition with shrub and herbaceous dominance.

Road building and yarding would result in soil disturbance and would increase the likelihood of non-native and potentially noxious species entering and/or increasing in the unit. Ground disturbance from road construction and yarding would temporarily set back native herbaceous communities and would impact underground fungal resources negatively. Design features addressing road construction, cleaning of equipment, yarding methods, and site preparation methods along with reserves are incorporated within the proposed action and alternatives to lessen or alleviate these effects. The native plant community would be expected to continue on a trajectory toward mature and then old-growth stand characteristics.

Little is known about the effects of harvest and regeneration on non-vascular plant components. The removal of overstory trees would have short term impacts on those species that form complex mychorizal or epiphytic relationships with overstory trees.

The Survey and Manage and Protection Buffer reserve for *Ulotia meglospora*; the placement of patch-cuts away from the high concentration area of *Loxosporopsis corallifera*; and the no-treatment areas of the Riparian Reserves would ensure a continued legacy for these species within the project area. Because the proposed management prescription for this unit is predominantly a thinning, ample populations, substrate, and habitat should remain in thinned areas, reserved areas, and outside of the sale boundary to assure the maintenance (and perhaps expansion) of *Loxosporopsis corallifera*.

Retention of minor species and hardwoods (design feature 11) would provide hosts for *Ulotia meglospora*, *Loxosporopsis corallifera*, and a diversity of bryophyte and lichen species as well as likely fungal associates. Retention of older/larger legacy trees (design feature 10) would also sustain bryophyte, lichen, and fungal diversity.

## **SOILS**

The proposed action and associated management practices would not cause soil compaction capable of impairing overall stand growth, long term productivity, or the hydrologic behavior of the treatment area. Sufficient litter, logging debris, and down logs would be retained to maintain soil organic material, soil organisms, and nutrient levels. There are no slope stability concerns within the treatment area. (The adjacent oversteepened riparian sideslopes of the east tributary of Greenleaf Creek at the south end of the project area would be excluded (reserved) from the treatment area due to potential slope instability in this area.)

## **AQUATIC AND RIPARIAN RESOURCES / FISHERIES**

There are currently no proposed or listed fish species in the project area. The Proposed action would have “No Affect” on any federally listed/proposed aquatic species based on the location in the headwaters, the distance to potential coho use areas, the retention of Riparian Reserves, and the proposed harvest plan.

Approximately 28 acres (33%) of the Riparian Reserve would be treated. The riparian treatment would promote development of large conifers, development of multi-layered canopies, and diversity of species composition within the Riparian Reserve as described relative to vegetation and wildlife. The proposed density treatment within the Riparian Reserves would accelerate tree growth to provide future sources of large wood for stream channels (providing more structure, cover, pools, and retention of gravel and small wood debris). The no-treatment stream buffers adjacent to the streams would protect streambanks, provide shade, and would contribute to maintaining current water quality and conditions of riparian and aquatic functions. This would include tempering of stream/riparian microclimates from edge effects, retaining slope stability and the associated protection from stream sedimentation, and maintaining litter inputs to stream/riparian areas. Maintenance of riparian vegetation within the no-treatment buffer would provide protection of fish habitat. These effects would contribute to the protection of water quality for downstream fisheries.

#### Stream Flows

There would be no measurable increase in low flows since the residual trees would use the increase in available water. Any changes in flows would be small relative to the natural range of flows that occur due to storm events.

#### Rain on Snow Events and Peak Flows

The proposed project area is not typically considered a rain on snow (ROS) zone. Consequently, there would be no expected increases in peak flows due to rain on snow events. In the event that there is a rain on snow event in the project area, the residual trees would lessen the effects from increased high flows. Any increase in flows from a ROS event would not exceed flow levels within the range of natural conditions.

#### In-Stream Structure and Stream Function

The density management within Riparian Reserve would accelerate the development of large conifers for future large wood contribution into the upper tributaries of Greenleaf Creek. This in-stream structure would provide for improved water quality by trapping sediments, stabilizing stream channels, and slowing high flows. This would improve fish habitat, increase the opportunity for exchange of ground water and stream water, and would maintain normal flooding of the floodplain. Future riparian restoration or silvicultural treatments may be necessary to accelerate long-term riparian recovery.

#### Stream Sediment

There would be approximately 0.6 miles of temporary dirt road and spur construction prior to harvest. There would be no new stream crossings with the new construction. This new road and spur construction would be decommissioned (design feature 22) after project completion. All temporary road and spur construction and proposed road renovation does not have the potential to deliver sediment to stream channels or impact

aquatic resources. There would be no increases in the drainage density from road construction, therefore, there would be no increase in peak flows due to roads.

There would be very low potential for any increase in sediment to the stream due to the proposed action. Any sediment entering at the project level would not likely be measurable downstream where coho are potentially present.

## **WILDLIFE**

The proposed density management treatment would modify dispersal habitat, however the project area would continue to provide spotted owl dispersal habitat by maintaining 40% canopy closure. Consultation with the U.S. Fish and Wildlife Service was completed with the issuance of a Biological Opinion in October, 1998. Because of the modification of dispersal habitat, this project would "*May Affect, but is Not Likely to Adversely Affect*" the northern spotted owl. If no marbled murrelets are detected during the second year of surveys (summer, 1999), this action would have "*No Affect*" on this species. If murrelets are found to occupy the neighboring suitable habitat, then appropriate seasonal restrictions, additional consultation with the USFWS, or other mitigation would be enacted to protect this species. This action would have "*No Affect*" on the bald eagle, and other federally listed/proposed terrestrial species. With the completion of the proposed thinning, habitat for the above three species would gradually improve over time. Ultimately, the late seral qualities of the project area would provide foraging habitat for the spotted owl as well as roosting and nesting habitat for all three species.

Quality of goshawk habitat would decline immediately after the density management treatment due to ground disturbance and subsequent disruption of the prey base. As the prey base recovers, foraging opportunities would improve. There would then be a second reduction in foraging opportunities as brush encroaches within the stand. As the stand matures, the brush component would begin to die out as the canopy closes and light to the forest floor diminishes. The subsequent reduction in brush and increased size of remaining trees would result in better foraging and nesting opportunities for this raptor.

Immediately after the proposed treatment, the value of hiding and thermal cover for big game would be reduced. The older habitat to the east would still provide this component. Forage would increase in the newly treated stand until it is shaded out by a closing canopy. As the understory and multiple canopies develop, hiding, escape, and thermal cover would improve and be maintained once the stand reaches the late successional condition.

Retention of snags would provide habitat for cavity nesting. Species preferring early to mid-successional stands and edge habitat such as the dark-eyed junco, winter wren, and corvids, would be expected to utilize this stand after treatment. Ultimately, this stand is expected to provide habitat for late seral species such as the hermit warbler and pileated woodpecker.

One mollusk species, *Megomphix hemphilli*, (a land snail) was found at one site within the survey area (234 acres) for all alternatives. This known location is within a no treatment area of the Riparian Reserve and would not be affected by the proposed action. Although no mollusks were found within the treatment area, harvest activities and the temporary reduction in overstory canopy cover and understory vegetation cover would be expected to cause a reduction in the numbers of mollusks locally by resulting changes in site micro-climate and available refuge habitat. The mollusk populations are expected to continue their

presence for the long term within the project area with the implementation of the proposed action and the incorporated design features.

### **SNAGS / DOWN WOODY DEBRIS / FUELS**

The thinning or density management treatment would accelerate the development of large trees, providing a source for large snags and down wood. Suppressed mortality of smaller trees and the resulting smaller snags and down wood provided by this mortality would be reduced in the areas receiving density management. Herbaceous, fungal, and bryophyte diversity would be maintained by retention of existing snags and existing down logs, both within blowdown patches and throughout the treatment area. The increase in large down woody material in the density treatment areas over time, along with the retention of existing down logs and snags, would provide a number of ecosystem functions including habitat for many species, moisture retention, and nutrient retention and cycling. These effects would contribute to long term site productivity. Additional down woody debris would be provided with the cut-and-leave of additional trees within the stand (design feature 9).

Fuel loading from limbs and tops within the treatment area would increase but would be variable throughout the treatment area due to both the variable preharvest fuel bed conditions present and the variety of thinning densities that would be implemented. This fuel loading would be expected to be heavier in the lower overstory retention tree areas and patch-cuts. (Post harvest fuel loading is expected to be approximately 25-38 tons per acre in the proposed treatment area). Fuels would be almost entirely ground fuels with minor amounts of scattered ladder fuels. Site preparation within the ¼ and ½ acre patch cuts and understory would promote planting survival of conifers and establishment to meet wildlife objectives.

### **C. DIRECT AND INDIRECT EFFECTS OF ALTERNATIVE 2 (NO THINNING IN RIPARIAN RESERVE)**

This alternative would not thin any acres within the Riparian Reserve. This alternative would require the same road access (temporary road and spur construction, and road renovation) as required for Alternative 1. All other project design features would be similar to those proposed for Alternative 1. Approximately 28 less acres within the project area would be thinned with this alternative.

### **VEGETATION**

There would be less variation in vegetation within the resulting stand as compared to the proposed action due to less acres treated within the project area. The effects to upland vegetation would be the same as those described in the Proposed Action, Alternative 1. The forest within the Riparian Reserve would not be thinned. The effects on vegetation due to not thinning the Riparian Reserves using this alternative would be the same as the effects on vegetation described for the No Action, Alternative 4.

### **BOTANICAL RESOURCES**

No Threatened, Endangered or Special Status plant species would be affected by this alternative. In general, the effects to botanical resources within the upland would be the same as those described in the Proposed Action, Alternative 1. The effects to botanical resources within the unthinned Riparian Reserve with this alternative would be similar to those described in the No Action, Alternative 4, except there would be some down wood creation (design feature 9) within the Riparian Reserve with this alternative that would benefit herbaceous, fungal, and bryophyte diversity.

Both Site B and Site D of *Ulotia meglospora* are located within the upland in Strata No. 3 and would be affected similar to Alternative 1. Site A of *Ulotia meglospora* is within a no-treatment area of the Riparian Reserve with all alternatives. The effects to *Ulotia meglospora* would be the same as those described in Alternative 1.

The occurrence of *Loxosporopsis corallifera* within the upland would be affected similar to Alternative 1, since the upland treatments would be the same with both Alternatives 1 and 2. Any occurrence of *Loxosporopsis corallifera* within the Riparian Reserve would be affected similar to the No Action, Alternative 4 and would be maintained but would not likely show the increases in occurrence possible with Alternative 1 due to the lower light conditions that would be present.

## **SOILS**

The effects to Soils within the upland LSR would be the same as those described in the Proposed Action, Alternative 1. There would be no effects to soils within the Riparian Reserve with this alternative.

## **AQUATIC AND RIPARIAN RESOURCES / FISHERIES**

This alternative would have "No Effect" on any federally listed/proposed aquatic species similar to the proposed action. None of the Riparian Reserve would be thinned with this alternative. This would reduce management related disturbance within the Riparian Reserve. However, the development of large conifers, snags, and down wood that would benefit streams, and aquatic and riparian resources within the Riparian Reserve would develop slower with this alternative.

### Stream Flows

There would be no measurable increases in low flows since the residual trees would use the increase in available water similar to Alternative 1. There would be even a lower probability of any increases in low flows with Alternative 2 due to the greater number of residual trees in the untreated Riparian Reserve.

### Rain on Snow Events and Peak Flows

The proposed project area is not typically considered a rain on snow (ROS) zone. Consequently, there would be no expected increases in peak flows due to rain on snow events. In the event that there is a rain on snow event in the project area, Alternative 2 would show less of an increase in high flows than Alternative 1 due to the greater number of residual trees within the untreated Riparian Reserve.

### In-Stream Structure and Stream Function

The untreated Riparian Reserve would protect streambanks, provide shade, and would contribute to maintaining current water quality and conditions of riparian and aquatic functions similar to the No Action, Alternative 4. Large conifers and the associated large, in-stream structure and benefits large conifers provide in the Riparian Reserve would develop the same as the No Action, Alternative 4 and slower than Alternatives 1 and 3.

### Stream Sediment

The direct and indirect effects due to roads with Alternative 2 would be the same as Alternative 1 since both alternatives would use the same road system and would require the same amount of temporary road and

spur construction, and road renovation. All proposed temporary road and spur construction, and road renovation within the project area would not deliver flow or sediment to stream channels. There would be very low potential for any increase in sediment to the stream due to the Alternative 2 action. Any sediment entering at the project level would not likely be measurable downstream where coho are potentially present.

## **WILDLIFE**

Alternative 2 would have effects to wildlife similar to Alternative 1 except Alternative 2 would not modify dispersal habitat for the northern spotted owl and habitat for other species within the Riparian Reserve. The development of late-successional habitat within the Riparian Reserve would occur slower delaying the beneficial effects of habitat for late-successional dependent species, riparian species and in-stream aquatic species similar to Alternative 4.

Although no mollusks were found within the treatment area, harvest activities and the temporary reduction in overstory canopy cover and understory vegetation cover would be expected to cause a reduction in the numbers of mollusks locally by resulting changes in site micro-climate and available refuge habitat as described in Alternative 1. However there would be less expected impact on local numbers of mollusk species with this alternative due to no treatment in Riparian Reserve. The mollusk populations are expected to continue their presence in the long term within the project area similar to Alternative 1.

## **SNAGS / DOWN WOODY DEBRIS / FUELS**

The environmental effects of the upland LSR density management treatment relative to the development of large snags and down wood, would be the same as those effects described with Alternative 1. The development of large trees for future recruitment of large snags and down wood is expected to occur slower over the long term in the Riparian Reserve due to no thinning in this area. This alternative, however, would provide for the retention of existing down wood and snags both in the upland LSR and Riparian Reserve and would provide for additional down wood (design feature 9) similar to Alternative 1. Management related fuel loading from tops and limbs would be less due to no thinning within the Riparian Reserve. Fuel loading would increase over time with the increase in small down wood from suppressed mortality and disturbance patterns within the Riparian Reserve.

## **D. DIRECT AND INDIRECT EFFECTS OF ALTERNATIVE 3 (NO THINNING WITHIN STRATA No. 3)**

The action with this alternative would be similar to the Proposed Action, Alternative 1, except Strata No. 3 would not receive a density management treatment. The current stand density of Strata No. 3 is approximately 115 trees per acre. This strata was commercially thinned approximately 16 years ago. This alternative would require the same road access (temporary road and spur construction and road renovation) as required for Alternative 1. Design features 2 and 3 to provide protection for *Ulota meglospora* and *Loxosporopsis corallifera* would not be necessary with this alternative. All other project design features would be similar to those proposed for Alternative 1. Approximately 24 less acres within the project area would be thinned with this alternative. Both Alternatives 1 and 3 would treat approximately the same number of acres within the Riparian Reserve

## **VEGETATION**

The direct and indirect effects within the upland LSR and Riparian Reserve area to be treated would be comparable to those forest and vegetation effects described in the Proposed Action, Alternative 1, except

there would be approximately 24 less acres of density management in the upland with this alternative affecting less forest and vegetation. The effects to the forest stand and vegetation would be comparable to those described within the proposed action except there would be a higher retained stand density within Strata No. 3 contributing to less light in the understory, and less development of the understory vegetation and canopy layering. There would also be less variation in stand density within Strata No. 3 with this alternative. The forest and vegetation in the area of the upland LSR not treated (Strata No. 3) would develop similar to the No Action Alternative 4.

## **BOTANICAL RESOURCES**

The effects to Botanical resources within the upland and Riparian Reserve would be comparable to those described within the Proposed Action, Alternative 1 except there would be less habitat diversity within the resulting stand for botanical species within Strata No. 3. This alternative would minimize microclimate changes and disturbance to the *Ulota meglospora* site located within Strata No. 3 due to no treatment within the strata. The high concentration area of *Loxosporopsis corallifera* within Strata No. 3 would be maintained with this alternative but would not likely show the increases in occurrence possible with Alternative 1 due to the lower light conditions with this alternative.

## **SOILS**

The effects to soils within the upland LSR would be the same as those described in the Proposed Action, Alternative 1, except there would be no effects to soils within Strata No. 3 with this alternative due to no treatment within this area. The effects to soils within the Riparian Reserve would be the same as those described in the Proposed Action, Alternative 1.

## **AQUATIC AND RIPARIAN RESOURCES / FISHERIES**

Alternative 3 would have effects to aquatic and riparian resources, and fisheries comparable to those effects described in Alternative 1. This alternative would have “No Affect” on any federally listed/proposed aquatic species similar to the proposed action.

## **WILDLIFE**

Alternative 3 would have effects to wildlife comparable to Alternative 1 except Alternative 3 would not modify dispersal habitat for the northern spotted owl and habitat for other species within Strata No. 3. The development of late-successional habitat within Strata No. 3 would occur slower with this alternative, delaying the beneficial effects of habitat for late-successional dependent species, riparian species and in-stream aquatic species.

Although no mollusks were found within the treatment area, harvest activities and the temporary reduction in overstory canopy cover and understory vegetation cover would be expected to cause a reduction in the numbers of mollusks locally by resulting changes in site micro-climate and available refuge habitat as described in Alternative 1. However, there would be less expected impact on local numbers of mollusk species with this alternative due to less treatment area in the upland. The mollusk populations are expected to continue their presence in the long term within the project area similar to Alternative 1.

## **SNAGS / DOWN WOODY DEBRIS / FUELS**

The environmental effects of the upland LSR and Riparian Reserve density management treatment relative to the development of large snags and down wood, would be similar to those effects described with Alternative 1. This alternative would provide for the retention of existing down wood and snags both in the upland LSR and Riparian Reserve and would provide for additional down wood (design feature 9) similar to Alternatives 1 and 2. Management related fuel loading from limbs and tops would not occur within Strata No. 3 with this alternative due to no treatment.

## **E. DIRECT AND INDIRECT EFFECTS OF ALTERNATIVE 4 (NO ACTION ALTERNATIVE)**

### **VEGETATION**

Upland and Riparian Vegetation- The upland LSR and Riparian Reserve would receive protection from any treatment related disturbance. The development of late-successional stand characteristics would be entirely dependent on natural disturbances and forest succession that would occur slower over time. With the higher overstory tree densities retained in the upland LSR stand and Riparian Reserve, the available light reaching the understory would be limiting to understory vegetation and the development of a secondary or multi-layered forest canopy. The micro-habitats and climates associated with gaps that favor the initiation of the understory and the development of structural and habitat characteristics associated with mature forests would be expected to occur slower over time entirely dependent on natural disturbance.

### **BOTANICAL RESOURCES**

The “No Action” alternative would have no effect on existing botanical resources in the short term. The development of diverse habitat for a variety of botanical species would occur slowly through natural disturbances (ie. wind, fire, insects, and floods); succession; and aging of the LSR and Riparian Reserve over time.

### **SOIL RESOURCES**

The “No Action” alternative would have no effect on soil resources.

### **AQUATIC AND RIPARIAN RESOURCES / FISHERIES**

The “No Action” alternative would have no effect on any federally listed/proposed aquatic species. The untreated LSR and Riparian Reserve would protect streambanks, provide shade, and would contribute to maintaining current water quality and conditions of riparian and aquatic functions. This would include tempering of stream and riparian microclimates from edge effects, retaining slope stability in the steep sideslopes and headwaters of the east tributary of Greenleaf Creek, and the associated reduction of stream sedimentation, and maintaining litter inputs to streams and riparian areas. These effects would contribute to the protection of water quality for downstream fisheries and to the protection of riparian, aquatic and wetland associated resources. (See “vegetation effects” above for delayed development of late-successional stand characteristics within the riparian with this alternative.)

### **WILDLIFE**

The “No Action” alternative would not modify dispersal habitat for the northern spotted owl and habitat for other species in the upland LSR and Riparian Reserve. The development of late-successional stand characteristics would be entirely dependent on natural disturbances and suppressed mortality that would occur slower over time. Species preferring early to mid-successional stands and edge habitat such as the

dark-eyed junco, winter wren, and corvids, would be expected to continue to occupy this stand. As the stand matures, species more associated with later seral stages are expected to occupy this stand. Such species include the hermit warbler and pileated woodpecker.

### **SNAGS/ DOWN WOODY DEBRIS / FUELS**

The development of large trees for future recruitment of large snags and down wood is expected to occur slower over the long term in the upland LSR and Riparian Reserve due to no density treatment with this alternative. The development of large snags and down wood would be entirely dependent on natural disturbances and suppressed mortality that would occur slowly over time. Fuel loading would increase over time with the increase in small down wood from suppressed mortality and disturbance patterns within the upland LSR and Riparian Reserve.

## **VI. CUMULATIVE EFFECTS**

### **A CUMULATIVE EFFECTS OF ALTERNATIVE 1 - THE PROPOSED ACTION**

This analysis incorporates the analysis of cumulative effects in the *USDA Forest Service and USDI Bureau of Land Management Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl, February 1994, (Chapter 3 & 4)* and in the *Eugene District Proposed RMP / EIS November, 1994 (Chapter 4)*. These documents analyze most cumulative effects of timber harvest and other related management activities. None of the alternatives considered in this environmental assessment would have cumulative effects on resources beyond those effects analyzed in the above documents. The following section supplements those analyses, providing site-specific information and analysis particular to the alternatives considered here.

### **VEGETATION**

#### Recent and Planned Density Management and Timber Sale Actions

The current vegetation pattern within the Lake Creek watershed has been described in the *Affected Environment* section of the EA. Within the Lake Creek Watershed, BLM has completed one timber harvest sale of 18 acres since the implementation of the Northwest Forest Plan. Other timber sales planned or currently being harvested within the watershed include 18 acres of regeneration harvest and approximately 592 acres of thinning within the Matrix land use allocation (LUA). These include the Bear Cub, Hult View, and Ten High timber sales. The Ten High timber sale is part of a long term density management study. Approximately 460 acres of additional density management treatments are being planned within the next few years within the LSR of this watershed. The proposed action ( Alternative 1) would result in approximately 148 treated acres within an approximate 206 acre project area of second growth forests within the LSR to meet late-successional habitat objectives. (The project area includes approximately 86 acres of Riparian Reserve of which approximately 58 acres would be left untreated to contribute to the protection of water quality for downstream fisheries and to the protection of riparian, aquatic associated resources; and 28 acres would be thinned to promote the development of late-successional stand characteristics for the attainment of long term ACS objectives.)

With the implementation of the Northwest Forest Plan, there would be an increase in mature and old forest habitat within the watershed over time as the Late-Successional Reserves (LSRs) and Riparian Reserves mature and develop. Approximately 19,159 acres of the Lake Creek Watershed are designated as Late-Successional Reserve (LSR). This is approximately one third (27.8%) of the total watershed area and approximately 60 percent of the BLM ownership in the watershed. (*Lake Creek Watershed Analysis, June 1995*) The proposed action would contribute to the development of this late-successional habitat both in the LSR and Riparian Reserve within the Lake Creek Watershed.

### **BOTANICAL RESOURCES**

The Proposed Action, Alternative 1, would have no cumulative effect upon federally listed threatened or endangered plants. Survey and Manage Component 1 and 3, and Protection Buffer species are known to occur within the project area as described in *Section IV, Affected Environment* of the EA. The Survey and Manage and Protection Buffer areas within the proposed action, together with the Riparian Reserves and LSR across the watershed would maintain and contribute to the long term continued presence and viability of these Survey and Manage and Protection Buffer species populations throughout the project area and watershed. These species would be managed in accordance with the District management strategy developed for these species over time incorporating adaptive management as more information becomes known for these species.

The proposed action would contribute to the long term development of diverse habitat for botanical species associated with mature, late-successional forests by maintaining and promoting the development of species diversity; structural and spatial diversity; and canopy layering within the watershed. The proposed action would accelerate the development of large trees to provide future large snags and down wood, which would provide habitat for a variety of botanical species. The proposed action would contribute to maintaining and restoring habitat to support well-distributed populations of native plants within the watershed and would contribute to maintaining and restoring species composition and structural diversity of plant communities in the LSR and Riparian Reserve.

### **SOILS**

The proposed action and associated management practices would not cumulatively impair overall stand growth, long term productivity, or impact aquatic resources.

### **AQUATIC AND RIPARIAN RESOURCES / FISHERIES**

The Proposed Action, Alternative 1, would contribute to the cumulative process of riparian recovery within the Lake Creek Watershed over the long term. The riparian treatment would contribute to the accelerated development of late-successional forests and large conifers within the Riparian Reserve of the Lake Creek Watershed, improving sources for large down wood within the riparian and in-stream structure in the long term. The untreated stream buffers within the Riparian Reserve would contribute to the protection of streambanks, provide shade, and would contribute to the protection of water quality for downstream fisheries, and aquatic species within the watershed.

### **WILDLIFE**

This proposed density management treatment along with other density treatments within the Late-Successional Reserves (LSRs) designated across the landscape would contribute to the maintenance and enhancement of late-successional forests as a network of habitat for late-successional forest-dependent

species, including the northern spotted owl. This network of LSRs, along with the network provided by the Riparian Reserves, would enhance a sustainable and intermixing population of owls. With the implementation of the Northwest Forest Plan, there would be an increase in mature and old forest habitat within the watershed over time as stands within the LSRs and Riparian Reserves mature and develop.

The project area would still function as dispersal habitat for the northern spotted owl post - harvest. In addition the Riparian Reserves across the landscape would provide further dispersal habitat and connectivity. This proposed action would contribute to this objective by maintaining and promoting the development of late-successional conditions within the Riparian Reserves over the long term. Approximately 16,078 acres (50 percent) of the BLM managed lands within the watershed are designated as Riparian Reserve. (*Lake Creek Watershed Analysis, June 1995*)

The Survey and Manage mollusk reserve areas within the proposed action, together with the Riparian Reserves and LSR across the watershed would maintain and contribute to the long term continued presence and viability of these mollusk species populations throughout the project area and watershed. These species would be managed in accordance with the District management strategy developed for these species over time incorporating adaptive management as more information becomes known for these species.

#### **SNAGS/ DOWN WOODY MATERIAL/ FUELS**

The proposed action would contribute to the accelerated development of late-successional forests with large trees within the watershed. The increase in the numbers of large trees within the watershed would increase the future source for large snags and down wood within the watershed in the long term. The increase in large down woody material within the watershed, along with the retention of existing down logs and snags, would provide a number of ecosystem functions, including habitat for many species, moisture retention, and nutrient retention and cycling. These effects would contribute to long term productivity of the watershed.

#### **CUMULATIVE EFFECTS OF ALTERNATIVE 2**

Alternative 2 would contribute cumulatively to the accelerated development of late-successional conditions within the upland LSR within the Lake Creek Watershed in the long term. Within the upland LSR, Alternative 2 would have cumulative effects similar to those described for the Proposed Action , Alternative 1 above.

Within the Riparian Reserve, Alternative 2 would have cumulative effects comparable to those described in the No Action, Alternative 4 below since the Riparian Reserve would not be thinned. Alternative 2 would contribute to the cumulative riparian recovery within the Lake Creek watershed, however the recovery would occur slower dependent upon natural disturbance and forest succession over the long term.

#### **CUMULATIVE EFFECTS OF ALTERNATIVE 3**

Alternatives 3 would contribute cumulatively to the accelerated development of late-successional conditions both within the LSR and Riparian Reserve within the Lake Creek Watershed in the long term. Within the upland LSR and Riparian Reserve, Alternative 3 would have cumulative effects comparable to the cumulative effects described for the Proposed Action, Alternative 1 above except there would be 24 less acres treated in the upland. Alternative 3 would contribute to the cumulative riparian recovery within the Lake Creek watershed, similar to Alternative 1.

## **D. CUMULATIVE EFFECTS OF ALTERNATIVE 4**

### **VEGETATION**

Upland and Riparian Vegetation- The No Action alternative in the LSR and Riparian Reserve would contribute to reduced forest management related disturbance of the upland forest and riparian areas. The No Action alternative in the LSR and Riparian Reserve would result in slower development of late-successional habitat (large tree canopies, large snags and down wood, understory development, and structural and species diversity). The development of multi-layered canopies and structural and habitat characteristics associated with mature forests would be expected to occur slower over time dependent on natural disturbance. The development of multi-layered and patchy stand characteristics associated with gaps would develop dependent on natural disturbance in the long term.

### **BOTANICAL RESOURCES**

The “No Action” alternative would have no cumulative effect upon federally listed threatened or endangered plants. Survey and Manage Component 1 and 3 species and Protection Buffer species are known to occur within the project area as described in *Section IV, Affected Environment* of the EA. The No Action alternative, together with the Riparian Reserves and LSR across the watershed would maintain and contribute to the long term continued presence and viability of these Survey and Manage and Protection Buffer species throughout the project area and watershed. These species would be managed in accordance with the District management strategy developed for these species over time, incorporating adaptive management as more information becomes known for these species. The development of diverse habitat for a variety of botanical species would occur slowly through natural disturbances (i.e. wind, fire, insects, and floods), succession, and aging of the LSR and Riparian Reserve over time.

### **SOILS**

The “No Action” alternative would have no cumulative effect on soil resources.

### **AQUATIC AND RIPARIAN RESOURCES / FISHERIES**

The “No Action” alternative would contribute cumulatively to water quality for fisheries and to the protection of riparian, and aquatic resources from management related disturbance. The development of large conifers within the riparian for future sources of large down wood and in-stream structure would occur slower with this alternative. (See “vegetation effects” above for delayed development of late-successional stand characteristics within the riparian with this alternative.)

### **WILDLIFE**

The “No Action” Alternative 4 would not modify dispersal habitat for the northern spotted owl both in the upland LSR and Riparian Reserve. The forested area would continue to contribute cumulatively to dispersal habitat within the watershed and across the landscape. The cumulative development of late-successional forest habitat within the Lake Creek Watershed would occur slower with the “No Action” alternative dependent on natural disturbances and forest succession.

### **SNAGS/ DOWN WOODY MATERIAL/ FUELS**

The cumulative development of large trees for the future contribution of down wood and the development of future large snags would occur slower within the watershed over time dependent on natural disturbance and suppressed mortality. There would be an increase in numbers of small snags and small down material that would occur as a result of suppressed mortality that would occur as the dense forested stand matures and moves through succession.

## **VII. MITIGATION MEASURES**

Surveys for the 32 species listed in the Schedule Change EA will begin if technical feasibility problems can be solved. If it is determined by species experts that survey feasibility issues have been resolved throughout the suspected range of any of the 32 species, and if a letter of direction is received prior to issuance of a Decision Record, surveys and appropriate management actions would be implemented.

## **VIII AQUATIC CONSERVATION STRATEGY (ACS) OBJECTIVES**

**ACS OBJECTIVE 1 - Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.**

The purpose of the proposed action is to accelerate the development of mature forest conditions in lands managed as LSR. Limited riparian acreage is included in the thinning prescription. One or more corridors would be developed in the riparian on several streams, but the corridors are not expected to alter the condition of processes in the riparian area. Otherwise, the riparian and aquatic system will continue to mature at a natural rate.

**ACS OBJECTIVE 2 - Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include flood plains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.**

No alteration would be made in the aquatic system, and the basic integrity of the riparian area would be maintained. Processes and connectivity would not be altered.

**ACS OBJECTIVE 3 - *Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.***

No entry would be made into the aquatic system. Because of the protection provided to the stream channel and riparian areas, the current condition of stream banks and stream channels would be maintained.

**ACS OBJECTIVE 4 - Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the**

**biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.**

No sources of water quality problems are present; water quality, based on gaging information, has continued to be good for resident and anadromous salmonids. The proposed action would not introduce any contaminants. There is no current hydrologic connection between roads and the stream system in the project area and none would be added as a result of the proposed action. No active erosion is occurring in the project area. Retention of riparian vegetation and the proposed action, as a thinning, make it very unlikely sediment would be produced, and, if any is produced, it would not reach the stream channel. The closest coho are four miles downstream, well below where any sediment would be measured.

**ACS OBJECTIVE 5 - *Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.***

See discussion in No. 4. No increase in sediment is expected as a result of the proposed action.

**ACS OBJECTIVE 6 - *Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.***

No hydrologic connections exist between existing roads in the project area and none would be added as a result of the proposed action. The remaining trees and retained riparian vegetation is expected to utilize any additional flow that might become available as a result of the proposed thinning. As a result, no changes are expected in flows as a result of the proposed action.

**ACS OBJECTIVE 7 - *Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.***

Floodplain development is limited in the Greenleaf subwatershed except near the mouth where the stream interacts with the Lake Creek floodplain. The current water table and connectivity are similar to natural conditions. No change is expected as a result of the proposed action.

**ACS OBJECTIVE 8 - *Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.***

Only 28 acres of the 86 acres of riparian in the project area would be treated; that treatment is designed to accelerate tree growth and development of more mature conditions. The potential limited entry for cable corridors would not be expected to have an impact on the riparian function since they are limited in number

and size and would be closed very quickly by growth of vegetation. Riparian communities and function would be retained following implementation of the proposed action.

**ACS OBJECTIVE 9 - *Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.***

The proposed action would accelerate the development of larger trees, more mature forest habitat and greater habitat diversity in both the upland and riparian. Existing aquatic habitat would be maintained in the near-term with anticipated long-term improvement as trees increase in size and suitability for large wood structure.

## **IX. CONSULTATION AND COORDINATION**

### **A. PROJECT DEVELOPMENT**

The proposed action and alternatives were developed and analyzed by the following interdisciplinary team of BLM specialists:

Barry Williams	BLM Soil Scientist
Mark Stephen	BLM Forest Ecologist
Brett Jones	BLM Engineer
Dave Reed	BLM Fuels Specialist
Michael Southard	BLM Archaeologist
Phil Redlinger	BLM Silviculturist and Timber Planner
Al Corbin	BLM Timber Manager
Dan Crannell	BLM T & E and Wildlife Biologist
Russ Hammer	BLM Fisheries Biologist
Gary Wilkinson	BLM ARD/GIS Specialist
Kathy Pendergrass	BLM Botanist
Saundra Miles	BLM Recreation Planner - Visual Resources
Gary Hoppe	BLM Planning and Environmental Coordination
Graham Armstrong	BLM Hydrology

### **B. CONSULTATION**

#### **UNITED STATES FISH AND WILDLIFE SERVICE (USFWS)**

Pursuant to the Endangered Species Act, formal consultation was completed with the U.S. Fish and Wildlife Service (USFWS) on this proposed action. The USFWS issued its Biological Opinion on October 23, 1998. According to that Biological Opinion, Sammy Hill would “*May Affect, but is Not Likely to Adversely Affect*” the northern spotted owl due to modification of dispersal habitat within the unit. If no marbled murrelets are detected during the second year of surveys (summer, 1999), this action would have “*No Affect*” on this species. If murrelets are found to occupy the neighboring suitable habitat, then appropriate seasonal restrictions, additional consultation with the USFWS, or other mitigation would be enacted to protect this

species. This action would have “No Affect” on the bald eagle, and other federally listed/proposed terrestrial species.

#### **NATIONAL MARINE FISHERIES SERVICE (NMFS)**

Pursuant to the Endangered Species Act, formal consultation to evaluate the effects of the proposed action on coho salmon ( *Oncorhynchus kisutch* ) was not required to be conducted with the National Marine Fisheries since there would be “No Effect” to any federally listed/proposed aquatic species with the proposed action.

The Level 1 Coast Range Province Team agreed with the “No Effect” finding of the Bureau of Land Management based on the location in the headwaters, the distance to potential coho use areas, the retention of Riparian Reserves and the proposed harvest plan.

#### **CONFEDERATED TRIBES**

The Bureau of Land Management, Coast Range Resource Area consulted with the Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians as part of the cultural inventory to be conducted in conjunction with the environmental analyses process for the Fiscal Year 1998 and 1999 proposed timber sale program. Letters were sent on September 19, 1997 and September 24, 1997. No responses were received.

## **X. REFERENCES**

USDA, Forest Service and USDI, Bureau of Land Management. February 1994. *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl*. Washington D.C.

USDA, Forest Service and USDI, Bureau of Land Management. February 1994. *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl, Appendix J2 Results of Additional Species Analysis*.

USDA, Forest Service and USDI, Bureau of Land Management. April 1994. *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl*. Washington D.C.

USDA, Forest Service and USDI, Bureau of Land Management. November 1996. *Interim Guidance for Survey and Manage Component 2 Species: Red Tree Vole*.

USDA, Forest Service and USDI, Bureau of Land Management. September 1998. *Extension of Draft Interim Guidance for Survey and Manage Component 2 Species: Red Tree Vole*.

USDA, Forest Service and USDI, Bureau of Land Management. October 1998. *Environmental Assessment (EA) - To Change the Implementation Schedule for Survey and Manage and Protection Buffer Species*.

USDI, Bureau of Land Management. November 1994. *Eugene District Proposed Resource Management Plan/Environmental Impact Statement*. Eugene District Office, Eugene, Oregon.

USDI, Bureau of Land Management. June 1995. *Lake Creek Watershed Analysis*. Eugene District Office. Eugene, OR.

USDI, Bureau of Land Management. June 1995. *Eugene District Record of Decision and Resource Management Plan*. Eugene District Office, Eugene, Oregon.

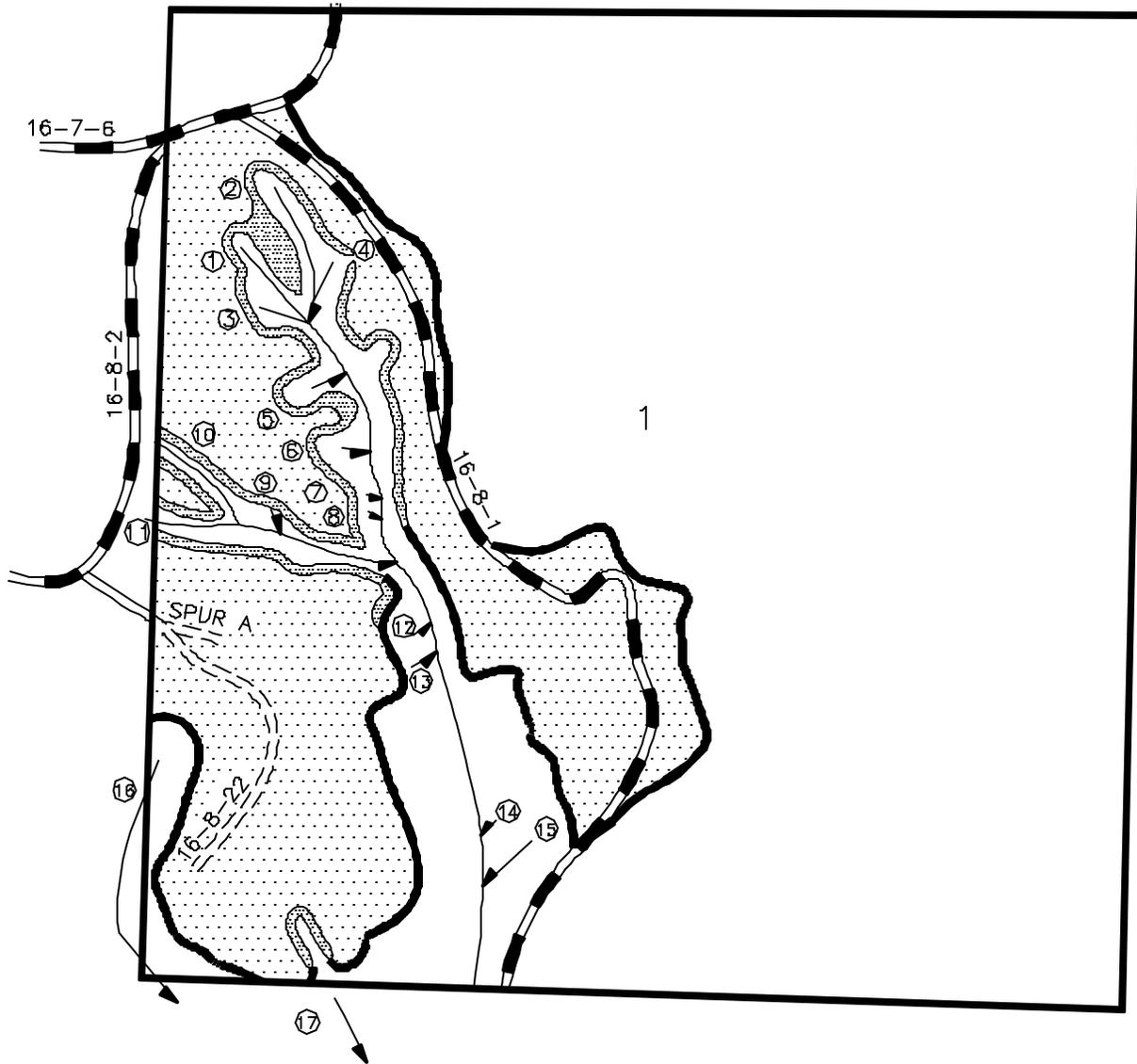
USDI Bureau of Land Management; Salem, Eugene, Roseburg, and Coos Bay Districts and the USDA Forest Service; Siuslaw National Forest 1997. *Late- Successional Reserve Assessment, Oregon Coast Province -Southern Portion- (R0267, R0268)*.

USDI, Bureau of Land Management. March 1999. *Plan Maintenance Documentation - To Change the Implementation Schedule for Survey and Manage and Protection Buffer Species*.

USDI, Bureau of Land Management and Oregon State Historic Preservation Office. 1998. Protocol Agreement.

UNITED STATES  
 DEPARTMENT OF THE INTERIOR  
 BUREAU OF LAND MANAGEMENT  
 SAMMY HILL EA MAP  
 PROPOSED ACTION

T. 16S. , R. 8W. , SEC. 1 , WILL. MER., EUGENE DISTRICT



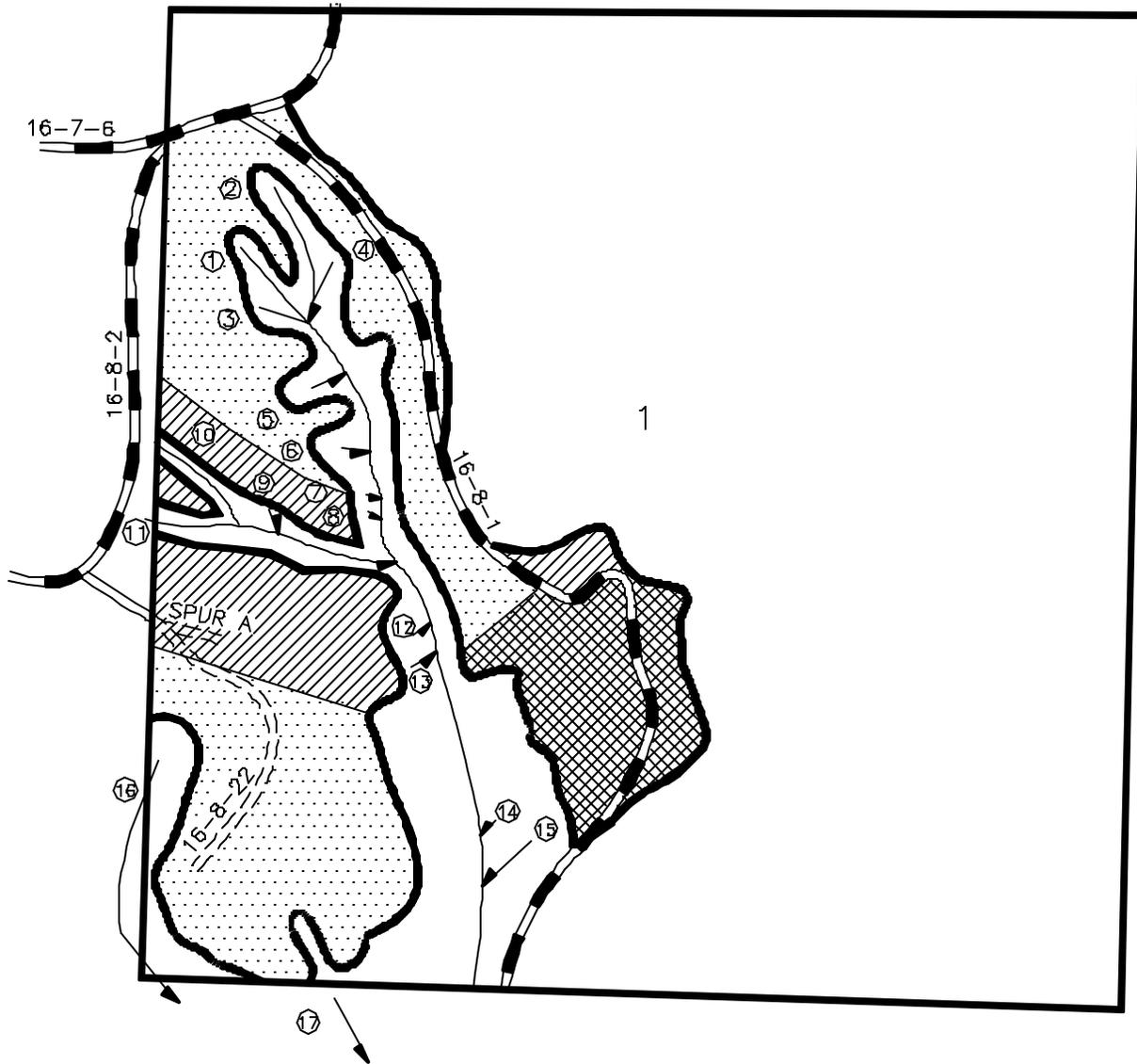
LEGEND

SCALE: 1" = 1,000 FT.

- |   |                          |   |                             |
|---|--------------------------|---|-----------------------------|
|  | NO TREAT AREA            |  | ROCKED ROAD                 |
|  | TREATED RIPARIAN RESERVE |  | DIRT ROAD                   |
|  | TREATED UPLAND           |  | DIRT ROAD TO BE CONSTRUCTED |
|   |                          |  | STREAMS                     |
|   |                          |  | STREAM ID NUMBER            |

UNITED STATES  
 DEPARTMENT OF THE INTERIOR  
 BUREAU OF LAND MANAGEMENT  
 SAMMY HILL STRATA MAP

T. 16S. , R. 8W. , SEC. 1 , WILL. MER., EUGENE DISTRICT



LEGEND

SCALE: 1" = 1,000 FT.

- |   |               |   |                             |
|---|---------------|---|-----------------------------|
|  | NO TREAT AREA |  | ROCKED ROAD                 |
|  | STRATA 1      |  | DIRT ROAD                   |
|  | STRATA 2      |  | DIRT ROAD TO BE CONSTRUCTED |
|  | STRATA 3      |  | STREAMS                     |
|   |               |  | STREAM ID NUMBER            |

**UNITED STATES DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
EUGENE DISTRICT OFFICE**

Preliminary  
Finding of No Significant Impact  
for  
Sammy Hill Density Management Project

Determination:

On the basis of the information contained in the Environmental Assessment, and all other information available to me, it is my determination that implementation of the proposed action or alternatives will not have significant environmental impacts beyond those already addressed in the *Record of Decision (ROD) for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (April 1994), and the *Eugene District Record of Decision and Resource Management Plan* (June 1995) with which this EA is in conformance, and does not, in and of itself, constitute a major federal action having a significant effect on the human environment. Therefore, an environmental impact statement or a supplement to the existing environmental impact statement is not necessary and will not be prepared.